

## **405 KAR 18:100. Permanent and temporary impoundments.**

RELATES TO: KRS 151.100, 151.250(3), 350.100, 350.151, 350.420, 350.455, 350.465, 30 C.F.R. 77.216, 77.216-3, Parts 730-733, Part 735, 817.49, Part 917, 30 U.S.C. 1253, 1255, 1266

STATUTORY AUTHORITY: KRS 350.028(1), (5), 350.151(1), 350.465(2), 30 C.F.R. Parts 730-733, Part 735, 817.49, Part 917, 30 U.S.C. 1253, 1255, 1266

NECESSITY, FUNCTION, AND CONFORMITY: KRS 350.028(1), (5), 350.151(1), and 350.465(2) authorize the Energy and Environment Cabinet to promulgate administrative regulations relating to surface and underground coal mining operations. This administrative regulation establishes the requirements for the design, construction, certification, inspection, and maintenance of temporary and permanent impoundments for underground mines. This administrative regulation differs from federal regulations as follows: (1) Section 1 of this administrative regulation provides criteria related to the stability, settlement, embankment height and width, and freeboard of impoundments, which are not found in the federal regulations. These criteria have been retained because they have long been effective guidelines for embankment safety and stability. (2) Section 1(9)(c) of this administrative regulation provides an exemption from engineering inspection for certain types of impoundments without embankments. These inspections are unnecessary because the embankments do not present a safety hazard or environmental concern that would warrant routine, detailed inspection. (3) Section 1(10)(b) of this administrative regulation provides an exemption from quarterly inspections for certain small nonhazardous impoundments without embankment structures. These inspections are unnecessary because the structures cannot develop the hazardous conditions which the inspections were intended to detect.

Section 1. General Requirements. The requirements of this section apply to both temporary and permanent impoundments.

(1)(a) Impoundments meeting the criteria of MSHA, 30 C.F.R. 77.216(a), shall comply with the requirements of 30 C.F.R. 77.216 and this administrative regulation. The plan required to be submitted to the district manager of MSHA under 30 C.F.R. 77.216 shall be submitted to the cabinet as part of the permit application after the plan has been approved by MSHA.

(b) All impoundments classified as Class B-moderate hazard or Class C-high hazard, and all permanent "dams," as defined in KRS 151.100(12), shall comply with 405 KAR 7:040, Section 4 and with 401 KAR 4:030.

(2) Design certification. The design of impoundments shall be certified by a qualified licensed professional engineer as designed to meet the requirements of this administrative regulation using current, prudent engineering practices, and any design criteria established by the cabinet in 405 KAR Chapters 7 through 24. The qualified licensed professional engineer shall be experienced in the design and construction of impoundments.

(3) Stability.

(a) 1. Permanent and temporary impoundments meeting the criteria of MSHA, 30 C.F.R. 77.216(a), all Class B and C impoundments, and all permanent impoundments, shall have a minimum static safety factor of 1.5 for the normal pool with steady seepage saturation conditions, and a seismic safety factor of at least 1.2.

2. Impoundments not included in subparagraph 1 of this paragraph, except coal mine waste impoundments, shall have a minimum static safety factor of 1.3 for the normal pool with steady state seepage saturation conditions.

(b) The constructed height of the dam shall be increased a minimum of five (5) percent over the design height to allow for settlement. Upon request, the minimum height increase may be

reduced if the material used and the design shall ensure against all settlement.

(c) The minimum top width of the embankment shall not be less than the quotient of  $(H+35)/5$ , where H is the height, in feet, of the embankment as measured from the upstream toe of the embankment.

(d) Unless the cabinet approves steeper slopes, based on site and slope stability, the sum of the upstream and downstream side slopes (h/v) of the settled embankment shall not be less than 5h:1v, with neither slope steeper than 2h:1v. Slopes shall be designed to be stable in all cases, even if flatter side slopes are required.

(e) The fill material shall be free of sod, large roots, other large vegetative matter, and frozen soil and shall not contain coal mine waste except for coal mine waste impounding structures pursuant to 405 KAR 18:160.

(f) The placing and spreading of fill material shall be started at the lowest point of the foundation. The fill shall be brought up in horizontal layers of thickness as is required to facilitate compaction and meet the design requirement of this administrative regulation. Compaction shall be conducted as specified in the design approved by the cabinet pursuant to subsection (2) of this section.

(g) The entire embankment including the surrounding areas disturbed by construction shall be stabilized with respect to erosion by a vegetative cover or other means immediately after the embankment is completed. The active upstream face of the embankment where water will be impounded may be riprapped or otherwise stabilized. Areas in which the vegetation is not successful or where rills and gullies develop shall be repaired and revegetated in accordance with 405 KAR 18:190, Section 4.

(h) Slope protection shall be provided to protect against surface erosion at the site and protect against sudden drawdown.

(4) Freeboard. Impoundments shall have adequate freeboard to resist overtopping by waves and by sudden increases in storage volume. The minimum elevation at the top of the settled embankment shall be one (1.0) foot above the water surface in the pond with the emergency spillway flowing at design depth. For embankments subject to settlement, this one (1.0) foot minimum elevation requirement shall apply at all times, including the period after settlement. Freeboard requirements shall not apply to incised impoundments that have no embankment or levee.

(5) Foundation.

(a)1. Foundation and abutments for the impounding structure shall be designed to be stable under all conditions of construction and operation of the impoundment and shall be designed based on adequate and accurate information on the foundation conditions.

2. For permanent and temporary impoundments meeting the criteria of MSHA, 30 C.F.R. 77.216(a), for all Class B and C impoundments, and for all permanent impoundments, foundation investigations as well as any necessary laboratory testing of materials shall be performed in order to determine the design requirements for foundation and embankment stability.

3. If an approved temporary impoundment has been constructed and the permittee subsequently seeks a permit revision to upgrade the structure to a permanent impoundment, the cabinet may waive the foundation investigations and laboratory testing required by subparagraph 2 of this paragraph under the following circumstances:

- a. The structure has been recently verified as being a Class A-low hazard structure;
- b. The structure does not meet the definition of the term "dam," as defined at KRS 151.100; and
- c. The cabinet approves conservative, assumed values for the strength parameters used in the stability analyses to ensure compliance with subsection (3)(a) of this section.

(b) All vegetative and organic materials shall be removed and foundations excavated and prepared to resist failure. Cutoff trenches shall be installed if necessary to ensure stability.

(6) Impoundments shall include a combination of principal and emergency spillways that shall be designed and constructed to safely pass the design precipitation event specified in this subsection, unless the cabinet requires a design based on a larger precipitation event due to site specific conditions. Twenty-four (24) hours may be used in lieu of six (6) hours for the duration of a design precipitation event specified in this subsection.

(a) Except as provided in paragraph (c) of this subsection, Class A structures that do not meet the criteria of MSHA, 30 C.F.R. 77.216(a), shall pass the:

1. Twenty-five (25) year, six (6) hour precipitation event if it is a temporary structure; or
2. The fifty (50) year, six (6) hour precipitation event if it is a permanent structure.

(b) Class A structures that do meet the criteria of MSHA, 30 C.F.R. 77.216(a), shall pass the 100 year, six (6) hour precipitation event.

(c) Class B and C structures and all permanent dams as defined in KRS 151.100(12) shall comply with the criteria established in 401 KAR 4:030.

(7) Class A impoundments not meeting the criteria of MSHA, 30 C.F.R. 77.216(a), may use a single spillway (if allowed pursuant to subsection (1)(b) of this section) if the spillway:

(a) Is an open channel of nonerodible construction and capable of maintaining sustained flows; and

(b) Is not earth or grass lined.

(8) The vertical portion of any remaining highwall shall be located far enough below the low-water line along the full extent of the highwall to provide adequate safety and access for the proposed water users.

(9) Engineer inspections. A qualified licensed professional engineer or other qualified professional specialist, under the direction of the professional engineer, shall inspect the impoundment. The professional engineer or specialist shall be experienced in the design and construction of impoundments.

(a) Inspections shall be made regularly during construction, upon completion of construction, and at least yearly until removal of the structure or release of the performance bond.

(b) The qualified licensed professional engineer shall promptly, after each inspection, provide to the cabinet a certified report that the impoundment has been constructed and maintained as designed and in accordance with the plan approved in the permit and 405 KAR Chapters 7 through 24. The report shall include discussion of any appearances of instability, structural weakness or other hazardous conditions, depth and elevation of any impounded waters, existing storage capacity, any existing or required monitoring procedures and instrumentation, and any other aspects of the structure affecting stability. The report shall also confirm the hazard classification of the impoundment, or if the hazard classification has changed, the report shall contain a detailed explanation of the change and the conditions causing the change. A copy of the report shall be retained at or near the mine site.

(c) An impoundment with no embankment structure, that is completely incised or is created by a depression left by backfilling and grading, that is not a sedimentation pond or coal mine waste impoundment and is not otherwise intended to facilitate active mining, shall be exempt from this subsection unless the cabinet determines and notifies the permittee in writing that engineering inspection and certification are necessary to ensure public health and safety or environmental conditions.

(10) Operator examinations.

(a) Impoundments subject to 30 C.F.R. 77.216, and Class B and C impoundments, shall be examined in accordance with 30 C.F.R. 77.216-3.

(b) Impoundments not included in paragraph (a) of this subsection shall be examined at least quarterly by a qualified person designated by the operator for appearance of structural weakness and other hazardous conditions. Quarterly examinations shall be conducted each calendar quarter (i.e., January-March, April-June, July-September, and October-December) and no two (2) examinations shall be within thirty (30) days of each other unless additional examinations within a quarter are required based on evidence of structural weakness or hazardous conditions. Reports of the examinations shall be retained at or near the mine site. An impoundment with no embankment structure, that is completely incised or is created by a depression left by backfilling and grading, shall be exempt from this paragraph.

(11) Emergency procedures. If any examination or inspection discloses that a potential hazard exists, the person who examined the impoundment shall immediately notify the department and the Kentucky Division of Water, or if these agencies cannot be reached, Kentucky Emergency Management. The permittee shall immediately implement emergency procedures formulated for public protection and remedial action. If adequate emergency procedures cannot be formulated or implemented by the permittee, the cabinet shall be notified, and the cabinet shall notify the appropriate agencies that other emergency procedures are required to protect the public.

(12) Maintenance. An owner or operator of an impoundment shall:

- (1) Cut vegetative growth where necessary to facilitate inspection and repairs;
- (2) Clean any ditches and spillways; and
- (3) Remove any combustible material present on the surface, other than that used for stability such as mulch or dry vegetation.

Section 2. Permanent Impoundments. A permanent impoundment of water may be created, if authorized by the cabinet in the approved permit based upon the following demonstration:

(1) The size and configuration of the impoundment will be adequate for its intended purposes.

(2) The quality of impounded water will be suitable on a permanent basis for its intended use and, after reclamation, will meet applicable state and federal water quality standards, and discharges from the impoundment will meet applicable effluent limitations and will not degrade the quality of receiving water below applicable state and federal water quality standards.

(3) The water level will be sufficiently stable and be capable of supporting the intended use.

(4) Final grading will provide for adequate safety and access for proposed water users. Perimeter slopes shall be stable and shall be protected against erosion.

(5) The impoundment will not result in the diminution of the quality and quantity of water utilized by adjacent or surrounding landowners for agricultural, industrial, recreational, or domestic uses.

(6) The impoundment will be suitable for the approved postmining land use. (8 Ky.R. 1566; eff. 1-6-1983; 15 Ky.R. 485; 1085; eff. 12-13-1988; 24 Ky.R. 741; 2672; eff. 6-10-1998; Crt eff. 7-3-2018; 46 Ky.R. 1353, 2274; eff. 5-5-2020.)